

Final Project Report Template

1. Introduction

1.1. Project overviews

Objective: Analyse cosmetics industry trends using **Tableau and Python** to provide insights on brand popularity and consumer preferences.

Key Components:

- Data Collection & Processing: Gathering & cleaning cosmetics-related data.
- Data Analysis & Visualization: EDA using Python; dashboards in Tableau .
- Website Development: A Flask-based single-page website displaying insights.
- Final Implementation: Hosting Tableau dashboards for interactive exploration.
- Outcome: A data-driven dashboard & web platform offering actionable insights into the cosmetics market.

1.2. Objectives

- Analyze Consumer Trends** – Identify popular cosmetics, skincare, and beauty products based on data.
- Brand Performance Insights** – Compare different brands based on market popularity and consumer preferences.
- Market Trends Visualization** – Use **Tableau dashboards** to present key industry insights interactively.
- Skin Type Suitability Analysis** – Understand which brands/products are preferred for different skin types.
- User-Friendly Dashboard** – Create an accessible **Flask-based website** for visualizing data insights.
- Data-Driven Decision Making** – Help businesses and consumers make informed cosmetic choices.

2. Project Initialization and Planning Phase

2.1. Define Problem Statement

Problem Statement (PS)	I am (Customer)	I'm trying to	But	Because	Which makes me feel
PS-1	a college student	Learn Data Analytics	I struggle with SQL and tableau	I have prior experience with databases or visualization tools.	Frustrated and unsure about my job prospects
PS-2	A English learner	Improve my communication skills	I lack confidence in speaking	I don't get enough conversation	Nervous in interviews and social situations

			fluently	practice	
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2.2. Project Proposal (Proposed Solution)

Project Overview	
Objective	Develop a tool to visualize EV charging patterns and range efficiency.
Scope	Analyze EV charging data, battery performance, and range optimization.
Problem Statement	
Description	Limited insights into EV charging behavior and range.
Impact	Helps users optimize charging and policymakers improve infrastructure.
Proposed Solution	
Approach	Data processing , visualization, and interactive dashboard.
Key Features	Charging trend analysis, range optimization, and web integration.

2.3. Initial Project Planning

Phase	Planned Duration	Completion Date
Data Collection	3 Days	✓ Completed
Data Cleaning & EDA	4 Days	✓ Completed
Dashboard Development	5 Days	✓ Completed
Web Integration	5 Days	✓ Completed
Testing & Deployment	3 Days	✓ Completed

3. Data Collection and Preprocessing Phase

3.1. Data Collection Plan and Raw Data Sources Identified

Section	Description
Data Overview	The dataset includes cosmetic product details such as brand, price, ingredients, and suitability for different skin types.
Data Cleaning	Handled missing values in price and skin suitability attributes, removed duplicate product entries.
Data Transformation	Filtered data by product category, sorted brands by ranking, and created calculated fields for price averages
Data Type Conversion	Converted price and ranking columns to numerical format for accurate analysis.
Column Splitting and Merging	Extracted key ingredients from descriptions and merged related brand categories.
Data Modeling	Established relationships between brands, product categories, and skin suitability using Tableau.
Save Processed Data	Stored cleaned data for visualization and further analysis in Tableau.

3.2. Data Quality Report

Quality Dimension	Description	Status
Accuracy	Verified product details, pricing, and ratings against source data.	<input checked="" type="checkbox"/> Good
Completeness	Missing values in some attributes were handled.	<input checked="" type="checkbox"/> Managed
Consistency	Standardized price formats and category names.	<input checked="" type="checkbox"/> Consistent

Quality Dimension	Description	Status
Validity	Checked for correct data types (e.g., numeric values for price, categorical values for skin type).	<input checked="" type="checkbox"/> Valid
Uniqueness	Removed duplicate records to avoid bias in analysis.	<input checked="" type="checkbox"/> No Duplicates
Timeliness	The dataset is relevant to current market trends.	<input checked="" type="checkbox"/> Updated

3.3. Data Exploration and Preprocessing

Data Exploration

Checked Data Structure – Reviewed column names, data types, and values.

Statistical Summary – Analyzed price distribution, average ratings, and brand frequency.

Missing Values – Identified and handled null or incomplete data.

Outliers Detection – Verified unusual price variations or extreme ratings.

Preprocessing

Preprocessing Step	Action Taken
Handled Missing Data	Filled missing values where possible; removed rows with excessive missing data.
Data Type Conversion	Converted price and rating columns to numerical format.
Category Standardization	Unified brand names and product types.
Duplicate Removal	Eliminated repeated records for accuracy.
Created Derived Columns	Added new metrics like Average Rating per Brand and Price Range Classification.

4. Data Visualization

4.1. Framing Business Questions

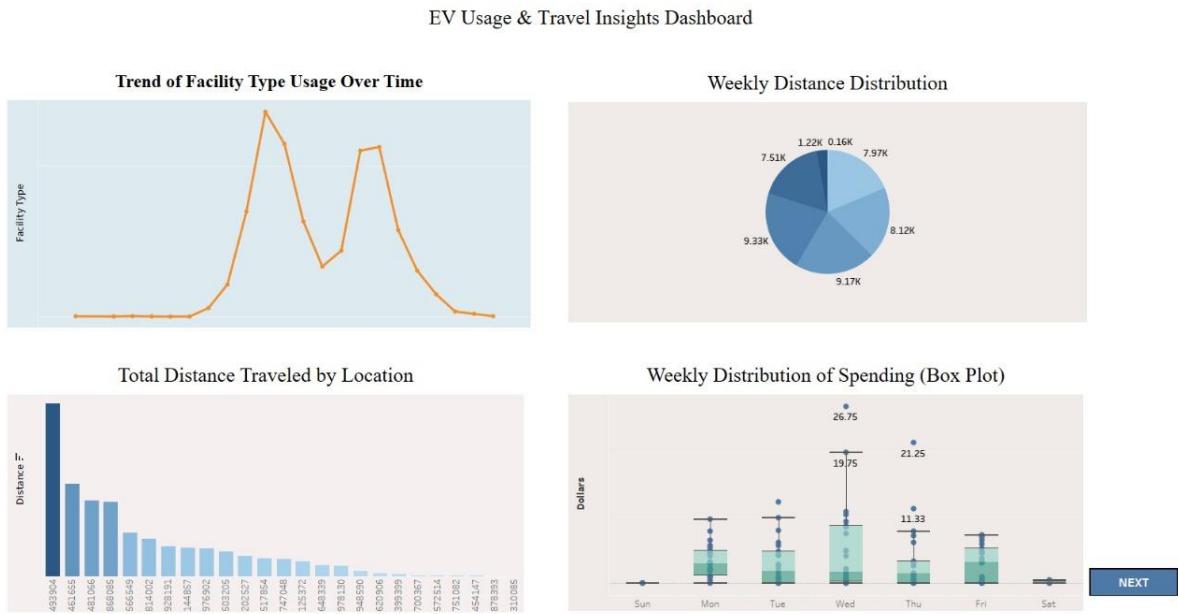
4.2. Developing Visualizations

Steps for Visualization Development

1. Data Preparation:
 - Cleaned and imported the dataset into Tableau.
 - Connected Tableau to the data source for real-time updates.
2. Chart Selection:
 - Selected chart types that best represent the data, such as bar charts, pie charts, and scatter plots.
3. Interactive Features:
 - Added filters and tooltips for enhanced user interactivity.
4. Dashboard Integration:
 - Combined charts into a cohesive dashboard for better storytelling and analysis

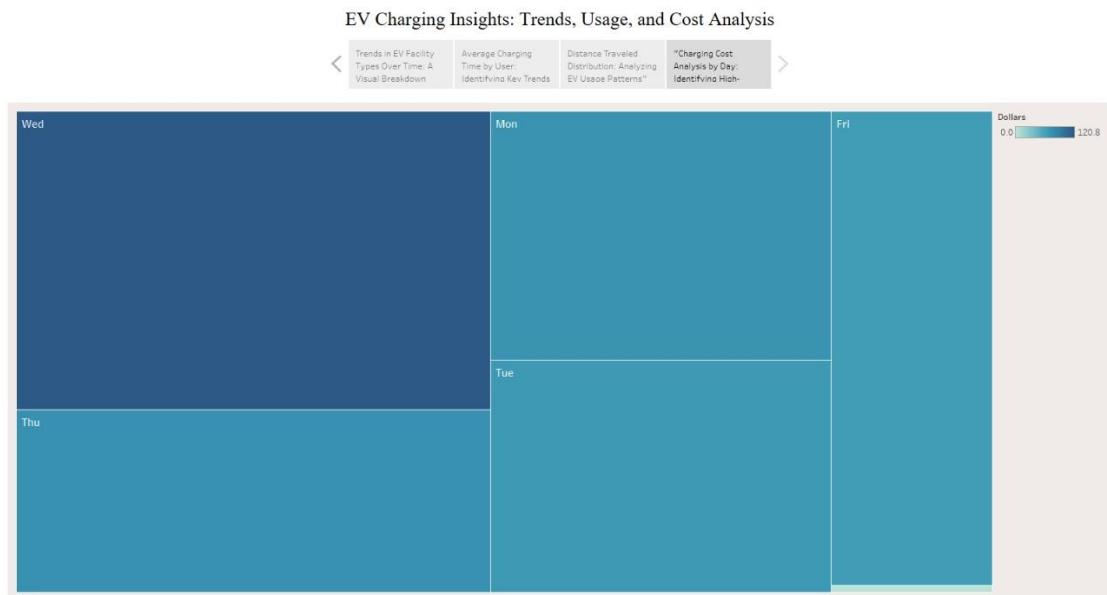
5. Dashboard

5.1. Dashboard Design File



6. Report

6.1. Story Design File



7. Performance Testing

7.1 Utilization of Data filters

- Location ID
- User ID
- Weekday
- SUM(Distance)
- SUM(Dollars)

7.2 No of Visualization

1. Dollar Distribution by weekday
2. Weekly Dollar Trends (In/Out Transactions)
3. Title: Weekly Revenue Distribution
4. Weekly Distance Distribution
5. Daily Trend of Facility Usage
6. Average Charging Time per User
7. Electric Vehicle Charging and Usage Analysis
8. EV User Travel Analysis

8. Conclusion/Observation

Visualization tools like Tableau and Power BI simplify EV charge and range analysis by transforming complex data into clear insights. They help identify patterns, monitor charging station performance, and support data-driven decisions. Through interactive dashboards and comparative analysis, stakeholders can optimize EV infrastructure and predict future trends, contributing to a more sustainable transportation system.

9. Future Scope

Visualization tools will evolve with real-time data analysis, AI-driven predictive insights, and enhanced geospatial mapping. They will optimize charging station placement, predict battery performance, and provide sustainability insights. Advanced, interactive dashboards will support smarter decision-making, driving the growth of EV infrastructure and adoption.

10. Appendix

10.1. Source Code(if any)

Source Code

The project utilized Flask, HTML, and CSS to develop a web application that integrates Tableau dashboards for visualizing cosmetic industry insights.

Flask (Python) – Used to create the web framework for hosting the dashboard.

HTML & CSS – Designed the website layout and styling for an interactive user experience.

Tableau Embed Code – Integrated Tableau Public dashboards into the website for real-time insights.

10.2. GitHub & Project Demo Link

Github link :

<https://github.com/Bhargavipetta/visualization-tool-for-electric-vehicle-charge-and-range-analysis>

Project Demo Link :

https://drive.google.com/drive/folders/1JwkKlm_vLSMAUkf-fDmOXG1zpmHta5UI?usp=drive_link